

IN THE CLAIMS

Please amend the claims to read as follows:

Listing of Claims

1-29. (Cancelled).

30. (New) An adaptive modulation receiving apparatus comprising:

a receiver that receives a transmitted symbol;

a plurality of demodulators that each demodulates the received symbol based on a different demodulation pattern, corresponding to a bit of an idealized modulation constellation, such that each demodulator applies a demodulation pattern corresponding to a different bit of the idealized constellation; and

a plurality of detectors, each corresponding to a different demodulator and each performing error detection on demodulation information provided by the corresponding demodulator to determine whether a bit represented by the demodulation information was received correctly, wherein:

the bit represented by the demodulation information of each demodulator is the bit corresponding to the demodulation pattern applied by the demodulator,

the modulation applied to the transmitted symbol is not a higher level of modulation than that applied as the idealized modulation, and

regenerated information represented by the received symbol comprises the demodulation information produced by all of the demodulators.

31. (New) The receiving apparatus of claim 30, wherein each detector outputs the bit represented by the demodulation information of the corresponding demodulator as an effective bit if received correctly.

32. (New) The receiving apparatus of claim 30, further comprising a repeat requester that sends a repeat request to the transmitting apparatus that transmitted the symbol when one of the plurality of detectors detects an error.

33. (New) An adaptive modulation communication system comprising a transmitting apparatus and a receiving apparatus that communicate using a plurality of modulation levels, each modulation level corresponding to a constellation of symbols representing the set of distinct values that a particular number of data bits may express, wherein:

(a) the transmitting apparatus comprises:

 a selector that selects one of the plurality of modulation levels to apply in a communication,
 a modulator that modulates a set of bits in accordance with the selected modulation level so as to generate a symbol corresponding to the modulation level, and
 a transmitter that transmits the generated symbol to the receiving apparatus;

(b) the receiving apparatus comprises:

 a receiver that receives the transmitted symbol in accordance with the effects of the propagation channel,
 a plurality of demodulators that each demodulates the received symbol based on a different demodulation pattern, corresponding to a bit of an idealized modulation constellation, such that each demodulator applies a demodulation pattern corresponding to a different bit of the idealized constellation, and
 a plurality of detectors, each corresponding to a different demodulator and each performing error detection on demodulation information provided by the corresponding demodulator to determine whether a bit represented by the demodulation information was received correctly, wherein:

the bit represented by the demodulation information of each demodulator is the bit corresponding to the demodulation pattern applied by the demodulator,

the modulation applied to the transmitted symbol is not a higher level of modulation than that applied as the idealized modulation, and

regenerated information represented by the received symbol comprises the demodulation information produced by all of the demodulators.

34. (New) The system of claim 33, wherein the selector selects the modulation level using a number having an integer square root.

35. (New) The system of claim 33, wherein the selector selects the modulation level using a number not having an integer square root.

36. (New) The system of claim 33, wherein the modulator modulates the set of bits by arranging signal points such that a difference between the number of signal points in an I-axis direction and the number of signal points in a Q-axis direction is minimum.

37. (New) The system of claim 33, wherein the modulator modulates the set of bits using a modulation scheme in which a phase direction is identified by an axis that crosses an origin point in a signal space diagram.

38. (New) The system of claim 37, wherein the modulator modulates the set of bits using a modulation scheme in which an amplitude direction is identified by an axis that crosses an origin point in a signal space diagram.

39. (New) The system of claim 37, wherein each detector outputs the bit represented by the demodulation information of the corresponding demodulator as an effective bit if received correctly.

40. (New) The system of claim 33, wherein the transmitter transmits a pilot signal arranged in the middle of a maximum amplitude in a signal space diagram of the highest level modulation level selectable by the selector.

41. (New) The system of claim 33, further comprising a repeat requester that sends a repeat request to the transmitting

apparatus when one of the plurality of detectors detects an error.

42. (New) The system of claim 41, wherein the selector selects a modulation level for a next communication based on the channel quality estimated from the repeat request received from the receiving apparatus.